

Remarks:

Claims 1-18 are pending in the present application. Claims 15-18 are withdrawn. Claims 1-14 stand rejected. Claim 2-9 are objected to. Claims 1-15 are currently amended. No claims are canceled. Reconsideration is requested in view of the above changes and following remarks.

Support for Specification Amendments:

Paragraph 32 was amended to note that CSF stands for cerebrospinal fluid. Support for this amendment can be found in paragraphs 3, 5, and 9. Support can also be found in paragraph 37 which refers to “liquor cerebrospinalis” which is cerebrospinal fluid. In addition to the above change, two occurrences of 2,0 ml were changed to 2.0 ml. This change was made to place the measurements in U.S. format. Also, the phrase “ $2 = 280 \text{ nm}$ ” was replaced with the phrase “ $\lambda = 280 \text{ nm}$ ”. It is well known in the art that λ is the symbol for wavelength.

Support for Claim Amendments:

Claim 1:

Claim 1 has been amended to recite that the sample comprises a fluid. Support for this amendment can be found in paragraph 2 of the present specification. Claim 1 has further been amended to recite accommodating the sample in a measuring device. Support for this amendment can be found in paragraph 35 of the present specification. Claim 1 has also been amended to recite “measuring at least one macroscopic physical property” of a

sample. Support for this amendment can be found in paragraphs 10 and 13 of the present specification.

The phrase “data which characterize at least one condition of said sample” was previously present in the claim, but was moved. The phrase “determining at least one diagnostic characteristic of said sample based on a correlation between said at least one macroscopic physical property and said reference data” has also been added. This phrase finds support in paragraphs 11 and 12 of the present specification.

Claim 2:

A comma has been inserted between the words “velocity” and “viscosity.” The word “macroscopic” has been added to preserve antecedent basis with claim 1.

Claim 3:

The word “property” has been substituted for the word “value” to preserve antecedent basis with claim 1. The word “macroscopic” has been added to preserve antecedent basis with claim 1.

Claim 5:

The phrase “at least one physical value” has been replaced with the word “sample” for purposes of maintaining proper antecedent basis. Likewise, the phrase “macroscopic physical” has been added in numerous locations to preserve antecedent basis.

Claims 4:

The phrase “at different temperatures and pressures of said sample” has been changed to “at different temperatures and/or pressures of said sample.” This amendment finds support in paragraph 15 of the specification as filed. Claim 4 has also been amended to preserve antecedent basis with claim 1.

Claims 6, 7, 8, 10, and 11 have been amended to preserve antecedent basis with claim 1.

Claim 9:

The word “lipide” has been replaced with the word “lipid” due to a misspelling.

Claim 13:

The phrase “through said” was added. This phrase finds support in paragraph 33 which discusses both the RESOSCAN and ultrasonic PVT systems. It is well known in the art that these machines measure the absorption of sound energy and/or the velocity of sound *through* a given sample. Also, the word “prepared” was deleted for purposes of antecedent basis within the claim.

Claim 15:

The word “macroscopic” was added to claim 15 to preserve consistency with the method of claim 1. The addition of the word macroscopic is supported by the specification in paragraphs 10 and 13 of the present specification. The word “value” has been replaced with the word “property” for purposes of antecedent basis within the claim.

Response to Restriction Requirement:

The Applicants respectfully request the rejoinder of claims 15-18 in the pending application. In the original restriction requirement the Examiner indicated that the method of group 1 can be practiced by hand. The Examiner then noted that the viscosity of a liquid sample may determine the health of an organism and that viscosity may be determined by visual inspection. According to claim 1, however, the at least one macroscopic physical quantity of a sample is measured by the interaction of said sample with sound waves. Claim 15 likewise recites the interaction of the sample with sound waves.

According to MPEP 806.05(e) a “process and apparatus for its practice can be shown to be distinct inventions, if either or both of the following can be shown: (A) that the process *as claimed* can be practiced by another materially different apparatus or by hand; or (B) that the apparatus *as claimed* can be used to practice another materially different process.” (Emphasis in original).

Accordingly, it is insufficient for the Examiner to assert that simple visual inspection is equivalent to performing the process *as claimed* as visual inspection does not involve the use of sound waves. Therefore, as the Examiner’s example fails to read on the process *as claimed*, the Applicants respectfully request the rejoinder of claims 15-18.

Oath/Declaration

The Applicants have enclosed herewith a proper declaration for Dr. Theodor Funck. The Applicants also note the addition of inventors Zerr, Feldmann, and Bodemer under 37 C.F.R. 1.48(a). Enclosed herewith are (1) a request to correct the inventorship

that sets forth the desired inventorship change; (2) a statement from each person being added as an inventor that the error occurred without deceptive intention on his or her part; (3) an oath or declaration by each actual inventor; and (4) the \$130.00 fee according to 37 C.F.R. 1.17(i).

Claim and Specification Objections

The Examiner's objections to both the specification and claims have been corrected and are discussed in the portion of this response entitled "Support for Specification Amendments" and "Support for Claim Amendments" respectively.

Response to Claim Rejections under 35 U.S.C. 112, 2nd Paragraph

The Examiner has rejected claim 3 because it recites "a relative precision better than 10^{-3} " and the numerical value has no units. The Applicants respectfully direct the Examiner to paragraph 14 of the present specification. Paragraph 14 notes that the relative precision of 10^{-3} means a measurement of the at least one physical quantity with a systematic and statistical error lower than 0.1%. Measurements with this relative precision have the particular advantage of improved specificity and reproducibility for making the derived diagnostic correlation(s). The unit or dimensions associated with a value measured to better than 10^{-3} will depend upon the property being measured (viscosity, velocity, etc.). One of ordinary skill in the art will both understand the claim language and easily be able to assign the proper units to a given measurement.

The Examiner has also rejected claims 13 and 14 because it was unclear if the sample itself emitted a sound or if the sample is reflecting a sound directed at the sample.

The Applicants respectfully submit that the phrase “in a sample” means measuring sound “through” a sample. Those of ordinary skill in the art are aware that these phrases are synonymous. Further, the specification of the present application plainly describes measuring the velocity of sound in or through samples. See, for example, paragraph 33 of the present specification. In paragraph 33, the Applicants disclose measuring the velocity of sound in a sample using a RESOSCAN™. It is well known in the art that this machine measures the speed of sound in a given sample. Therefore, although the Applicants have amended claim 13 to use the word “through,” the Applicants submit that this word is, for purposes of the present claim, synonymous with the word “in.”

In light of the above, the Applicants respectfully request that the Examiner withdraw the pending 35 U.S.C. 112, 2nd paragraph rejection of claims 3, 13, and 14.

Response to 35 U.S.C. 101 Rejection

The Examiner has rejected claims 1, 3, 7, 10, 11, and 13 under 35 U.S.C. 101 because the Examiner believes that the claims are directed to non-statutory subject matter. With respect to claims 1, 3, 7, 10, and 11, the Applicants respectfully submit that this rejection is moot in view of the present amendments. No *prima facie* case of unpatentability has been established for claim 13, as claim 13 does not depend from claim 1 and was not individually addressed by the Examiner.

The Applicants do not concede that claim 1 as originally submitted was directed to an abstract idea, law of nature, or natural phenomena. Claim 1 has, however, been amended to recite that the sample comprises a fluid from a biological organism. Additionally, the first step of the claimed method now recites accommodating the sample in a measuring device.

The Applicants submit that these amendments are sufficient to remove any doubt as to whether the claimed subject matter is statutory. Specifically, the method as claimed in claim 1 requires action on the part of the person performing the method, namely accommodating the sample in a measuring device followed by measuring a property. These steps are transformative.

In addition to being transformative, however, the present method also produces a useful, concrete, and tangible result. The useful, concrete, and tangible result is determined in the final step of the present method which comprises determining at least one diagnostic characteristic of said sample based on a correlation between said at least one macroscopic physical property and said reference data. As noted in the specification in paragraph 12, a diagnostic characteristic is information that indicates any information or chemical/physical data being inherently and directly related to a particular pathologic condition (disease or group of diseases). The diagnostic characteristic *is* the useful, tangible, and concrete result.

The Examiner has also rejected claim 13 as being directed to non-statutory subject matter. As noted above, the Examiner did not address claim 13 individually. The Applicants submit that such individual treatment is necessary because claim 13 does not depend from claim 1 and uses substantially different language than claim 1. As such, the Applicants submit that the Examiner has not met his burden of establishing a *prima facie* case of unpatentability. ("The burden is on the USPTO to set forth a *prima facie* case of unpatentability." MPEP 2106(IV)(B), pg. 2100-10).

Evaluating the claim separately, though, it is clear that the method of claim 13 produces a useful, concrete, and tangible result. Specifically, claim 13 results in the detection of at least one disease producing biomolecule in the sample.

Response to 35 U.S.C. 102(b) Rejection:

The Examiner has rejected claims 1, 10, and 11 under 35 U.S.C. §102(b) in view of Berg, *et al* (“Berg”). Berg teaches a sonography method that is performed via ultrasound imaging of the brain “through the intact skull” (Berg, pg. 463, left column). According to amended claim 1, however, a sample comprising a fluid from a biological organism is accommodated in a measuring device. This claim language clearly indicates that the sample is located *outside* the biological organism. Berg simply does not disclose a sample as required by claim 1. Likewise, Berg does not disclose accommodating a sample in a measuring device. In Berg, the sonography method is performed *in vivo*. Therefore, as Berg does not expressly disclose all elements of amended claim 1, Berg cannot and does not anticipate the pending claims.

Response to 35 U.S.C. §103(a) Rejection:

Rejection of claims 1, 2, 5, 7-9 and 12 over Lowe, *et al* in view of Cohen-Bacrie

The Examiner has rejected claims 1, 2, 5, 7-9, and 12 as obvious under 35 U.S.C. §103(a) over Lowe, *et al*, (“Lowe”) in view of Cohen-Bacrie (“Cohen-Bacrie”). The Applicants respectfully submit, however, that Lowe and Cohen-Bacrie are not properly combinable. Even, however, if Lowe and Cohen-Bacrie are properly combined, which the Applicants do not concede, the resulting combination does not result in the presently claimed method.

Specifically, Lowe teaches an invasive method of obtaining a sample from a patient, *i.e.* drawing blood, and measuring the viscosity of the resulting whole-blood and plasma

samples. The viscosities of these samples are measured at high shear rates in a Coulter-Harkness viscometer. (Lowe, pg. 169, left column.)

Alternatively, Cohen-Bacrie discloses a non-invasive method of measuring viscosity using ultrasound. (Cohen-Bacrie, Abstract). Cohen-Bacrie's procedure estimates blood viscosity and pressure inside an artery using ultrasound measurements of blood flow. (Cohen-Bacrie, Introduction, column 2, pg. 1489). Cohen-Bacrie teaches that this methodology is a *preferred alternative* to the invasive procedures disclosed in Lowe. (Cohen-Bacrie, Introduction). Cohen-Bacrie teaches away from investigating a sample comprising a fluid from an organism because, unlike Lowe, it discourages obtaining a sample via an invasive procedure. As a direct consequence, one of ordinary skill in the art would not have been motivated to combine the references.

Even, however, if Lowe and Cohen-Bacrie, are properly combined, which the Applicant's do not concede, the resulting combination does not yield the presently claimed method. Specifically, fluid flow is required in each of the methods disclosed in Cohen-Bacrie – the Linearized Method; the Integral Method; and the Maximum Likelihood Method. In the Linearized Method, for example, a harmonic decomposition of velocity profiles is required. The Integral Method likewise requires the selection of at least two velocities to solve the equation. In the Maximum Likelihood Method, the value Q_R is the flow rate across a circular section of a tube. Lowe's sample, however, has no flow rate as the sample is static and divorced from the circulatory system.

Because Cohen-Bacrie methods require flow, it is therefore apparent that subjecting Lowe's static sample to an ultrasound according to the method disclosed Cohen-Bacrie

would not result in the measurement “of at least one macroscopic physical property of a sample” (Claim 1). Simply stated, because the fluid is stagnant, no data would result.

The Applicants, therefore, respectfully submit that claim 1 is not obvious in view of the arguments presented above. Cohen-Bacrie teaches away from combination with Lowe. Furthermore, even if Cohen-Bacrie and Lowe are combined, the resulting combination is non-functional as Lowe’s sample has no velocity. As claims 2, 5, 7, 8, 9, and 12 depend either directly or indirectly from claim 1, the Applicants respectfully submit that claims 2, 5, 7, 8, 9, and 12 are likewise not obvious.

Rejection of claims 4 and 6 over Lowe in view of Cohen-Bacrie further in view of Miwa

The Examiner has also rejected claims 4 and 6 as obvious under 35 U.S.C. §103(a) over Lowe in view of Cohen-Bacrie and further in view of U.S. 4,483,345 to Miwa (“Miwa”). Claims 4 and 6 depend directly or indirectly from claim 1 and recite additional features of the Applicants’ method. For the reasons discussed above with respect to claim 1, claims 4 and 6 are believed to be in condition for allowance. According to the Examiner, though, Miwa, in combination with Lowe and Cohen-Bacrie teaches measuring at different temperatures and pressures of a sample.

As with Cohen-Bacrie, the Applicants submit that Miwa is directed to a non-invasive method for measuring properties in a patient. Miwa describes its methodology as preferable to invasive procedures because of the disadvantages associated with invasive procedures including pain and the possibility of death due to mistake or infection. (Column 1, lines 16-21.) As such, Miwa teaches away from combination with Lowe, which teaches invasive procedures.

Even, however, if Miwa is properly combined with Lowe and Cohen-Bacrie, a point the Applicants do not concede, Miwa does not disclose measuring physical properties at two different pressures *and* temperatures as claimed by the Examiner. Specifically, the text cited by the Examiner in column 4 lines 55-60 mentions temperature, but states that blood having the **same** temperature and rate of gasification as the main measuring area can be found in other areas. This statement does not suggest measuring two different temperatures, and actually teaches measuring two areas with the same temperature. This is not what the Applicants claim.

As such, and in view of the arguments presented above, the Applicants submit that claims 4 and 6 are not obvious over Lowe in view of Cohen-Bacrie, further in view of Miwa. Miwa cannot be properly combined with Lowe and even if combined, does not suggest measuring at two different temperatures.

Conclusion

In view of the arguments and amendments, above, the Applicants respectfully submit that all claims are in condition for allowance. An early action to that end is earnestly solicited.

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Respectfully Submitted,
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